

## From Manual to Machine Switching

Promptly at midnight March 3, 1923, Seattle began using machine switching telephone equipment in Melrose, West and Rainier office districts, and the cutover which had been looked forward to ever since the machine switching program was announced, was completed, resulting in a success that far exceeded the most optimistic predictions made by anyone.

The cutover was directed from a centralized point located in room 206 Telephone Building and was under the direct supervision of Chief Dispatcher W. E. Hunting. Three No. 550-C 30 line P. B. X. switchboards, wired in multiple and one 80 line No. 550-C P. B. X. switchboards were installed for the use of the dispatcher during the cutover.

It was over this temporary exchange that the dispatchers directed every operation of the cutover in all the offices. Within easy reach was hung a large progress chart on which appeared the number of each operation, opposite which was the time set for it to be executed.

Record of the cutover was kept on this chart. Each number was encircled as the operation was begun and a cross placed within the circle as it was completed. This method not only kept the cutover progress in full view of those who were directing it, but also permitted the observers to see at a glance how the work was advancing.

From start to finish the cutover program proceeded as if it were an everyday occurrence. The plan was engineered so well that it assumed the aspect of some general routine with which all concerned were thoroughly familiar.

The first operation was scheduled for 3:30 P. M. March 3. Promptly at that time Earl Thompson cleared his throat and started the ball rolling by announcing the first operation. He occupied one of the positions of the multiple boards. Next to him sat L. H. Osthoff and Ted Hewitt as receiving dispatchers at the two other positions. As Earl made the first announcement "Tiney" John Harrison made a circle around the first operation number and the big job was on.

The traffic department was represented by G. Chalfant, R. D. March, and R. F. Anderson. The former was seated at the 80-line board and it was through him that the traffic department released the inter-office trunks to the plant to be cutover to the new equipment in both machine switching and manual offices.

It should be borne in mind that the cutover not only involved the three new machine offices but also the nine manual offices remaining in service, as well as the three offices being replaced. In each of the nine manual offices key and call indicator equipment was installed for the purpose of taking care of the interchange of calls between the two types of exchanges, manual and machine switching. In order to complete a call originating in one of the latter to a subscriber in a manual office, call indicator equipment was installed in the manual offices, and to handle calls from manual officesubscribers to machine switching office subscribers, key indicator equipment was installed in six of the manual offices. This was not done in Main, Elliott or Garfield, as they will soon be replaced with new machine switching offices. Calls originating in these exchanges for subscribers in the new mechanical offices will be com-

pleted through cordless "B" boards located in the latter exchanges. This method of inter-office trunking will be discontinued when the new Main, Elliott and Garfield offices are cutover, the date of which will be announced some time in the near future.

The switchboards in the dispatcher's office contained lines direct to each exchange, and it was over these lines that all operations were directed. Besides those already mentioned, six others constituted the dispatchers staff. They were Leonard Leighton, C. E. Morey, D. Tuttle, H. W. McCaffrey, S. E. Allbin, and T. H. Griffiths. The latter holding down the position of chief bug extender, should any thing like that enter the little exchange over which the cutover was handled.

Outside the rail, which separated them from the dispatchers, was assembled some thirty odd visiting telephone officials and, aside from the close smoking contests in which each seemed a serious contender, there was little or no excitement. Each time the chief custodian of the animated chalk, "Tiney" Harrison, made a circle or a cross on the chart it caused no further comment other than that it resembled a horse race without the horses or races or betting. D. P. Fullerton, general superintendent of plant, was looking for some excitement, but the machinery was too well oiled to permit of anything out of the ordinary.

At 9:30 P. M. about 500 telephone officials and employees gathered in the Assembly Hall and listened to F. E. M. Jones, supervisor of plant training, deliver a brief outline of the introduction of machine switching project in Seattle, and how the many difficult problems were overcome through the medium of the co-ordination committee who, it might be stated here, directed every subject involved in the project. Mr. Jones dwelt at length on the method of education adopted which in the main is the key note of the success attending the cutover. The educational plan was divided into three steps. The first step was that of the theoretical training of central office maintenance employees, and the next step was giving these same men practical training. This was obtained by the classes in the three new machine switching offices. They worked with the Western Electric installation forces for several months prior to the cutover. The next step was that of the dress rehearsals, on which occasions practically sixty-five per cent of the inter-office trunks were cutover and an interchange of calls over the key indicator, call indicator and mechanical equipment was effected, so that on the night of the big cutover the schedule was practically a repetition of what each employee was thoroughly acquainted with.

Dean Jones won for himself an excellent reputation as an extemporaneous orator. His method of introducing the distinguished visitors present was full of humor and brought out many laughs from the assembly. The introductions were as follows:

"We have with us this evening a man of whom I do not recall any particular characteristic except that he smokes a Jimmy pipe. For the information of those who do not know what a Jimmy pipe is, it is one of those pipes that when it gets to going good, you have to jimmy the



#### PLANT TRAINING SCHOOL INSTRUCTORS

J. T. Ostfeld, J. E. Nichols, L. N. Merritt, F. E. M. Jones, Superior Plant Training;  
E. A. Thompson, C. W. Carroll and W. J. MacKay.

windows and doors open to live. I introduce to you Mr. J. C. Nowell, vice-president and general manager.

We are all acquainted with the work of the Humane Society in connection with cruelty to dumb animals. We have a case of cruelty before us tonight, not related to dumb animals, but related to machinery.

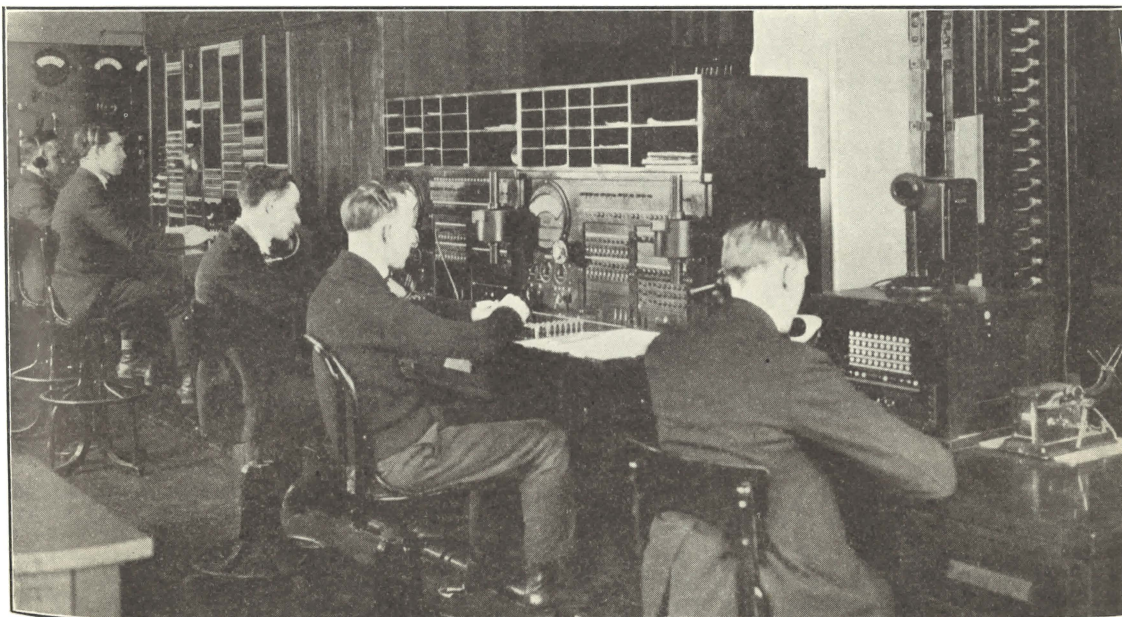
There is a man present this evening who drove an auto of great antiquity so far beyond its normal useful life that the entire auto-motive industry rose en masse in protest and compelled that man to purchase a Lafayette, which I understand is a blood relative to a Ford. I present to you Mr. C. W. Burkett, chief engineer.

Among us this evening is a man who was a switchboardman at the present main office, some years ago. Now this office is being replaced this year—I leave you to draw your own conclusions. I present to you Mr. D. P. Fullerton, general superintendent of plant.

We have with us this evening the supreme chief operator, Mr. J. H. Corcoran, general superintendent of traffic.

I do not know a thing about the next man, and if I were to say anything about him I would have to make it up, so I cannot take a chance—Mr. N. Wigton, assistant to general manager.

I see that we have the representative pencil pusher from the commercial department with us



SENDER MONITOR DESK, TEST DESK AND SERVICE OBSERVING DESK, RAINIER OFFICE



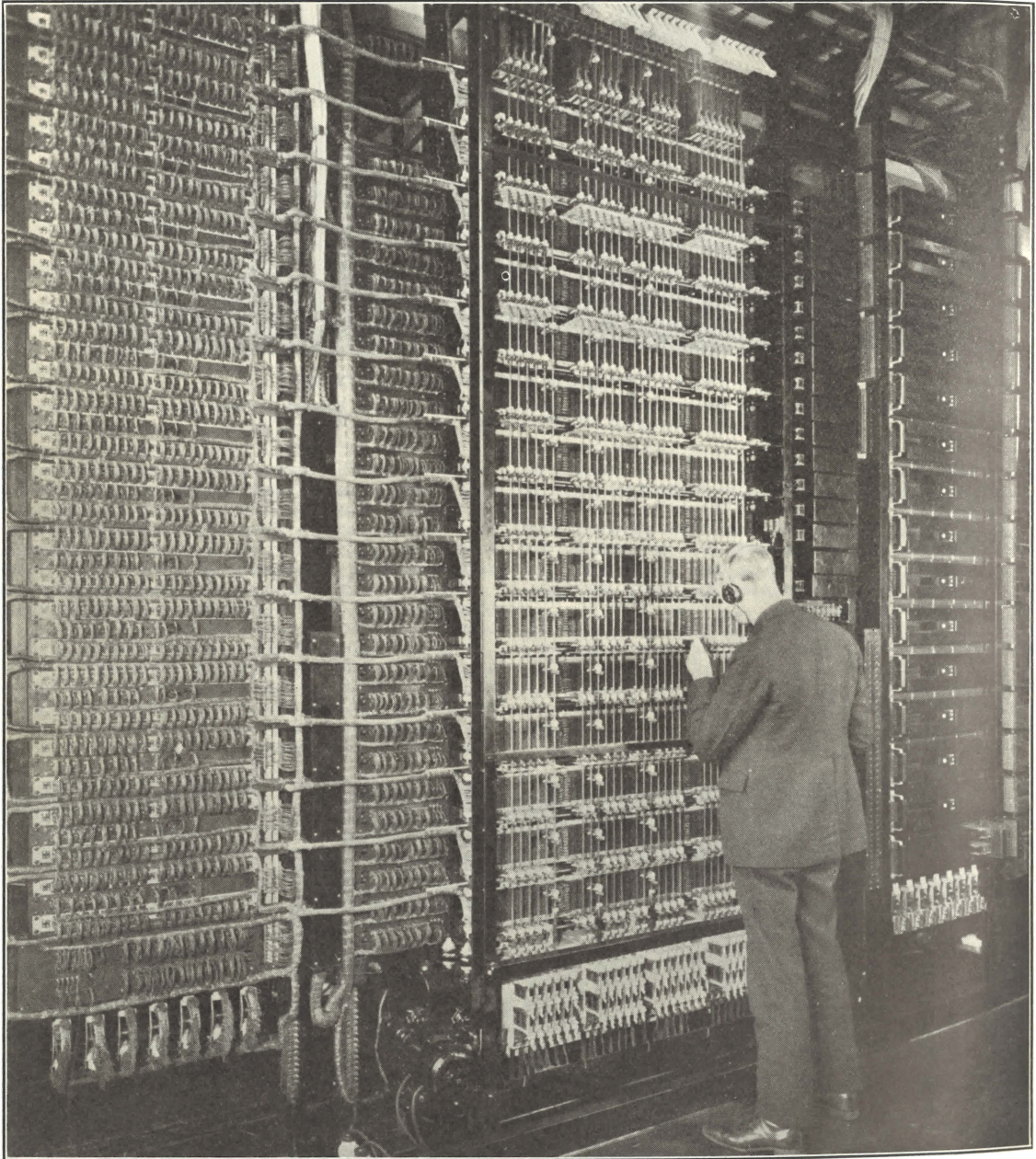
this evening. Mr. N. R. Powley, division commercial superintendent, Southern division.

I understand he uses an Eversharp.

We have another pencil pusher among us who does not use an Eversharp, but uses that device

There is present with us this evening the man who gave us our first lesson in machine switching—Mr. D. E. Wiseman, equipment engineer, chief engineer's office.

With us is a man who designs the ways and



**LINE FINDER FRAME, RAINIER OFFICE**

Frame on which machine switching telephone calls originate

that utilizes short lengths of lead pencils—Mr. C. E. Hickman, division commercial superintendent, Oregon division.

We have with us a man who comes to Seattle for the express purpose of finding out how a cutover should be conducted—Mr. Carl Whitmore, division superintendent of plant, Oregon division.

means to handle the traffic of telephone exchanges—Mr. R. E. Wolfe, traffic engineer, general superintendent of traffic's office.

Some of the gentlemen I am about to name brought the snow we experienced a few weeks ago, from New York—Mr. A. E. Van Hagen—A. T. & T. Co., New York.

The next man should not be on this list of



visitors as he has been here at least two months—Mr. L. R. Mapes, A. T. & T. Co., New York.

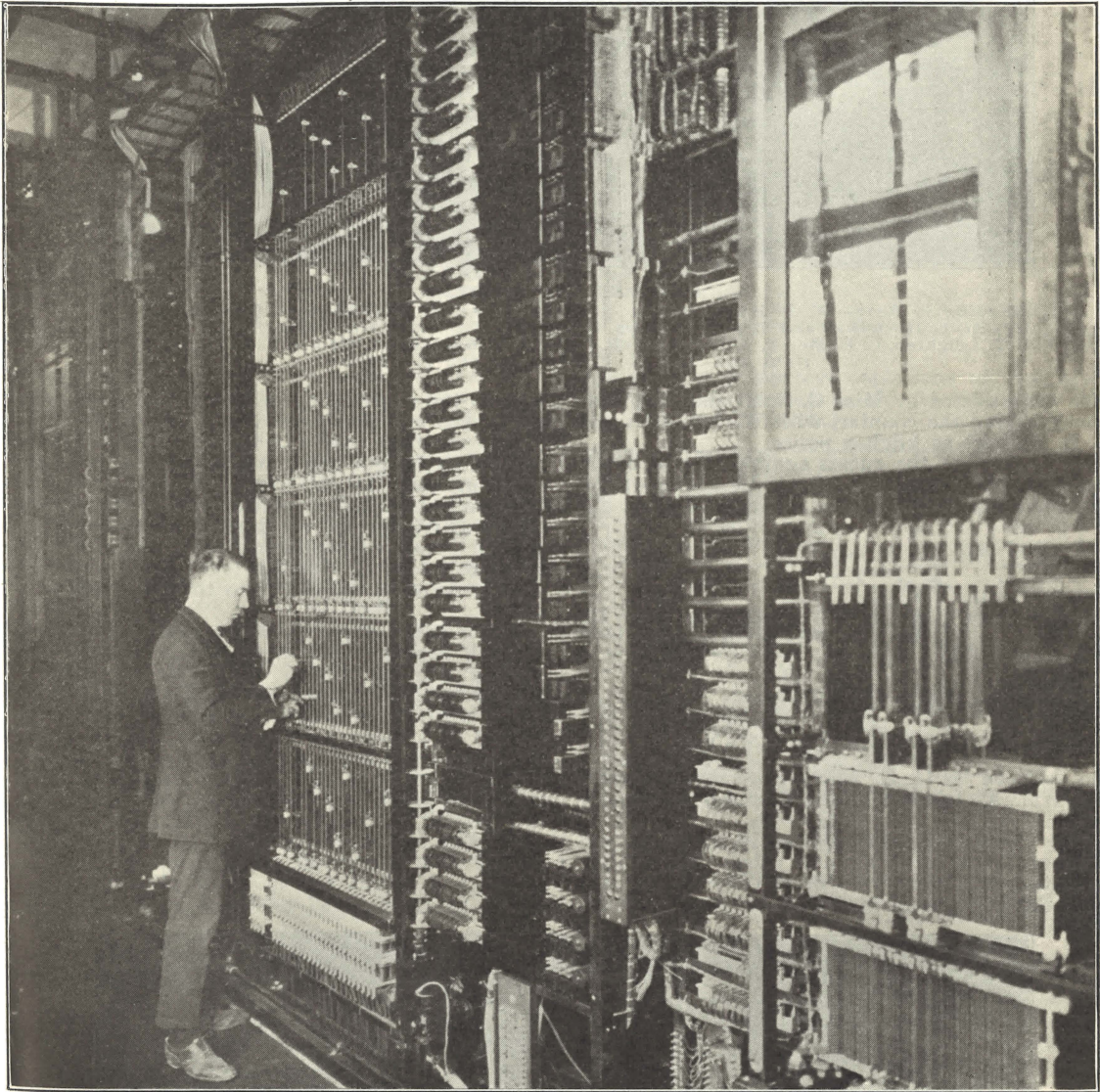
Another harbinger of winter—Mr. W. D. Sargent, A. T. & T. Co., New York.

Still another sign of winter—Mr. L. A. Dolan, A. T. & T. Co., New York.

In introducing the next visitor, I might state that I have seen his name on circuit drawings

Evidently anticipating trouble he brought along reinforcements in the person of Mr. C. M. Twelves, general superintendent of plant, Everett."

At the conclusion of Dean Jones' remarks, a moving picture was flashed on the screen describing the use of the dial telephone and how to properly use the dial. This film was displayed



**INCOMING FRAME, RAINIER OFFICE**

Frame over which access to ten thousand different telephone numbers may be had.

hundreds of times—Mr. W. H. Mathies, W. E. Co., New York.

I cannot conceive how the next man horned in on this list of visitors as he has been located in Seattle nearly three years—Mr. J. J. Foley, W. E. Co., Chicago.

I see we have another star boarder in this list—Mr. C. J. Hurley, W. E. Co., San Francisco.

There is with us our hated rival of Everett, Wash.—Mr. W. N. Winter, president Puget Sound Telephone Co., Everett.

in moving picture houses located in the districts effected by the cutover and was one of the methods of educating telephone subscribers how to use the dial. This film is the result of one of Division Commercial Superintendent W. J. Phillips' efforts as a scenario writer. When the lights were again turned on the assembly adjourned to the operators' lunch room on the eighth floor where sandwiches, coffee, cigars and cigarettes were served to the hungry crowd. Miss D. Bubb, supervisor of dining service, presided over the coffee urn.





#### CUTOVER DISPATCHERS

Standing in Rear—W. E. Hunting, chief dispatcher. At the switchboards, left to right—T. Hewitt, L. H. Osthoff and E. A. Thompson. Chart custodian, J. A. Harrison. Sitting at table—L. T. Leighton, C. E. Morey, J. T. McGough, H. W. McCaffrey, D. Tuttle and S. E. Allbin. To the right and rear—R. F. Anderson and G. Chalfant.

She was assisted by Miss G. Bubb and Miss Mahoney behind the counter, with W. J. Condit and L. L. Hulburt as kitchen police.

At 11:30 p. m. the guests again gathered in the Assembly Hall where the final operations of the cutover were displayed on a chart designed for



W. E. Hunting gives the order that almost blew the telephone over.

the occasion by G. E. Allen, chief draughtsman, and Wm. A. Johnson of the engineering department.

The chart had displayed on it the three old Melrose, West and Rainier offices illuminated, indicating that they were in service. Along side were the new offices in darkness. Over a direct

wire to the dispatcher's desk the final steps were announced and displayed on the chart and at 12 o'clock the final step was displayed by darkening the old exchanges and illuminating the new, announcing that the cut was completed.

Down in the chief dispatcher's office the routine of the afternoon and evening continued, each operation being completed on schedule time. At 11:45 p. m. W. E. Hunting took charge and personally directed the cut from that time till midnight.

About fifty observers were assembled outside the rail behind which the dispatchers were conducting the operations. J. J. Moore, superintendent of maintenance, and D. J. Lundy, district plant chief, upon whose shoulders rested the burden of a large part of the responsibilities of the program, stood leaning against the rail attentively watching the progress chart. At 11:50 p. m. the traffic representatives were instructed to intercept all traffic. At 11:53 p. m. old Melrose, West and Rainier offices were cut dead. One minute later the cutoff relay crews were posted in the new offices and at 11:57 the order, that meant so much to all telephone employees, was



#### NIGHT SHIFT, MELROSE OFFICE

Back row—C. E. Stockley, A. G. Martin, M. S. Dickson, A. D. Norman and Earl Edgar. Bottom row—E. A. Meyring, G. M. Deming, O. C. Mooney, F. D. Finnell, B. R. Jodrell and S. J. Wyman.





#### DAY SHIFT, MELROSE OFFICE

Top row—W. M. Holland, W. F. Hockanson, E. R. Bamber. Middle row—B. C. Strong, W. C. Moon, G. E. Alton, J. D. Madden. Bottom row—R. N. Powell, Wm. H. William, J. C. Rumball, H. H. Hill, H. H. Olson, Lou Norman, W. L. Larson, Geo. Pace, Elmer Brown and A. E. Johnson, wire chief.

given to pull the cutoff relay tools, and new Melrose, West and Rainier offices were in service. A nod to Mr. Moore and Mr. Lundy by the dispatcher indicated to them that the project in which they had played an important part for the past two years was successfully completed.

It had taken less than six minutes to transform 12,000 manual telephone stations to machine switching stations, cut in service three new machine switching offices, place in service call indicator equipment in nine manual offices and key indicator equipment in six of them. The whole operation involving fifteen different central offices, three of which were the offices killed, and gave to Seattle the first system in the history of telephony where key indicator equipment was cut in service over inter-office trunk cables.

#### New West Office

When "Bob" Fitzsimons at new West received the word that cut the office into service he yelled "Pull" so forcibly that he blew out all the lights, knocked the dust off the racks in the old office and sent all cutoff relay tools into the hands of those who stood ready to pull them.

Just before "Bob" yelled, E. C. Oliver, assisted by George Dunnavan, cautiously approached the fuse panel expecting a blowout to come from that quarter, but "Bob" fooled them and staged the blowout himself.

Roy D. Smith rushed to the gas engine room thinking the engine had exploded, Dave O'Neil rushed for a Saturday Evening Post to get the

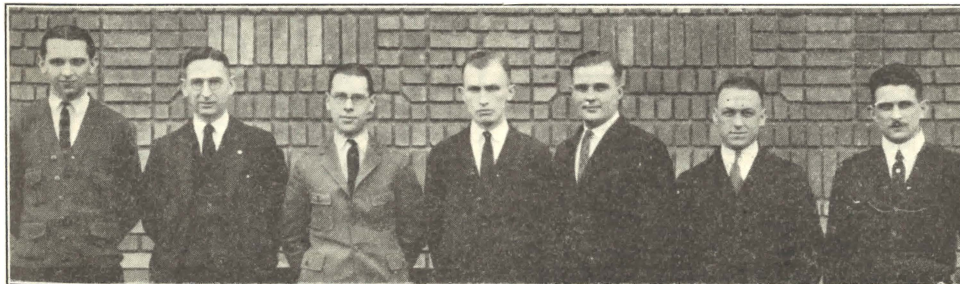
dope on how to prevent explosions of that kind and Ben Moon rushed to the door to keep the dial tones from escaping.



#### CUT-OVER DINING SERVICE

Elmer Johnson and Les Merritt display latest machine switching cafeteria service.

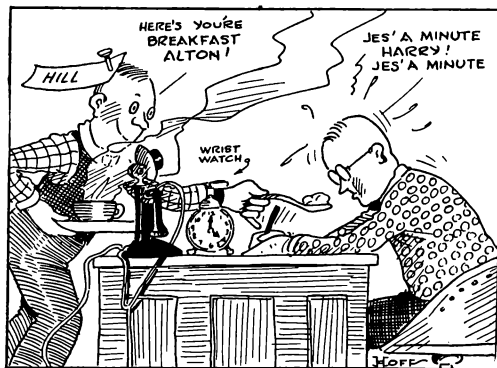
Outside of Fitz's terrific "Pull" there was no more racket and the gang settled down to wait on the results of the curios experiments subscribers would make with the dial telephones. At about 8:30 in the morning their fondest hopes



#### EVENING SHIFT, MELROSE OFFICE

C. E. Johnson, J. H. Kendle, W. B. Hayward, Joel Kenney, H. A. Wade, B. A. Cowling and M. M. Rutledge.





**H. H. HILL FEEDS GUY ALTON**

were realized. The sender selectors began to find all senders busy and from that time on till late in the evening the equipment received a thorough test and responded in a most satisfactory manner to every whim of the most curious subscriber. From midnight till midnight on March 4th, 72,479 calls were placed against an average daily load of approximately 19,000.

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### New Melrose Office

At Melrose office Les Merritt sat at the dispatcher's telephone with one end of a very much chewed toothpick protruding from his mouth. At 11:57 the toothpick scattered to the four points of the compass and he rattled the underpinning of the building's foundation with the command



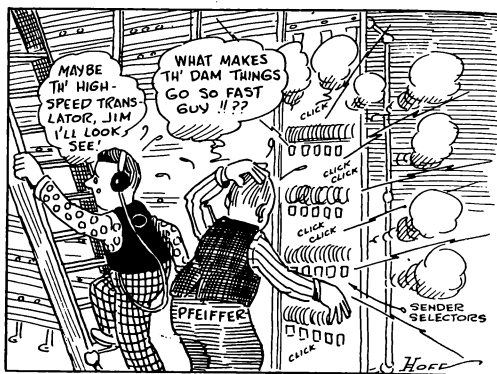
**PENSIONING OLD MELROSE**

"Pull" and Melrose office was in service.

Immediately a "selector rod" on a line finder frame started up to find the line on which waited Prof. E. S. Meaney of the University of Washington to place the first call in Seattle over the new equipment. A sender selector found an idle sender for him and he received the "dial tone." He then dialed his number. A "selector rod" on a district frame started up and found an idle trunk to the office in which the number called

was located. He had dialed MA in-2000. So an idle trunk to Main office was selected and an assignment lamp was lighted near the base of the plug on which was terminated the selected trunk in a "call indicator" position at Main office. The operator at that position depressed the assignment key associated with the lighted lamp and the number 2000 was displayed on the screen located in the key shelf in front of her. She then inserted the plug of the trunk cord into multiple jack 2000 and the call to Main 2000 was completed.

That was call number one, and by the end of the first day 52,123 calls had originated in Melrose as against a normal daily average of approxi-

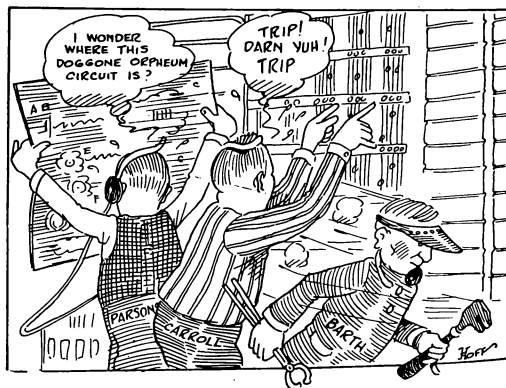


Jim Pfeiffer and Guy Strohm count the revolutions of the sender selectors. They soon lost count.

mately 29,000. By 9 o'clock Sunday morning the new equipment was being worked overtime. It seemed as if every subscriber in the district was trying to use the telephone at the same time.

Constable Olsen pointed to his senders with pride, and he had a right to be, as every one was busy and they remained that way the entire day. Senator Parmelee had a mighty busy crew also, every one of the selector rods on his line finder frame were doing double duty. Both these gentlemen wore worried looks, the constable because of the protection Lake City lacked and the senator because no one had time to listen to his oratory. Elmore Johnson, the wire chief, was so pleased that he forgot to eat his breakfast.

Guy Alton wasn't bothered much with the serv-



**APPLYING HOSKINS' METHODS**

Karl Parsons, Cliff Carroll and Lonney Barth run machine switching equipment after receiving instructive lesson from an expert.



ice observing until it came time to observe the dining service. Harry Hill proved 100 per cent in the latter, so Guy pulled through all right.

Les Merritt, with a test set in one hand and a monkey wrench in the other, straightened up the busy-backs.

The fellows that had the easy time were the sender monitors. Dean Jones, standing like the rock of Gibraltar, was on duty at the temporary sender monitor's desk answering Sunday school subscribers' questions. Walt Larson and O. D. T. Brandt were busy sending extra dialing digits out to subscribers who were running short.

Elmore Brown thought the winking lights was

to hum and buzz around like a sawmill hunting for idle senders. Jim Pfeiffer took a station opposite them and watched the fun. Cliff Carroll coaxed the selector rods on the line finders to not work so hard.

Lonney Barth pulled a shade over his eyes and went at the senders with a hammer and chisel, and the office worked fine. Karl Parsons searched for a theatrical circuit that could take care of the crowded condition. He also wanted to find what position the sequence switch was in when it performed the vaudeville stunts as explained by Wm. C. Hoskins of the Central office amusement committee.



#### DAY SHIFT, RAINIER OFFICE

Top row—E. E. Lyman, Jack Haworth, Karl Parsons, Jack Nelson. Second row—B. F. Marshall, W. J. Cross, G. H. Nelson, R. Meklare. Third row—Wm. L. Rumberg, L. E. Bliss, Wm. C. Hoskins. Fourth row—Neal Davidson, Carl Ellerbeck, D. M. Chisholm, R. D. Coy. Bottom row—Jno. E. Howlett, H. W. McFadden, H. S. Raynor, Miss Margaret Donohue, Mrs. A. E. Colbert, Miss Marie Frederickson, Miss Madge Orphan, C. W. Carroll, wire chief, L. W. Radford and G. C. Strohm.

some pretty girl carrying on a machine switching flirtation with him. Every time a light began to wink he would write a note and hand it to Rumball requesting him to "Go get 'er."

An air of mystery shrouded the office. The pass word stealthily spoken was: "Sh! Follow me." No doubt this was because the office was so still. Not a sound could be heard except the over-worked equipment.

#### ★ ★ New Rainier Office

At Rainier office Cliff Carroll, sitting at the dispatcher's telephone, yawned at 11:55 p. m. The gang thought he was going to sleep. Two minutes later he howled: Pull! This so startled the crew that they did as ordered, and Rainier was cut in service. And then everybody smiled and looked happy. Cliff adjusted his jaw and the office became normal and remained so until daybreak. The people in Rainier get up a little earlier than in other districts, so the stampede started earlier.

At about 8:30 a. m. the sender selectors started

Jack Haworth donated some Ford gears to take care of any failure of the two-speed ahead and one reverse gear on the selector rods of the final



**TELEPHONE OFFICIAL GETS SOME POINTERS**  
Sanitary Specialist Hoskins gives some valuable tips on machine switching equipment to a telephone official





#### EVENING SHIFT, RAINIER OFFICE

E. O. Provost, K. R. Ruffner, H. H. Warrick, W. P. Hilton, F. H. Bargman and L. A. Barth.

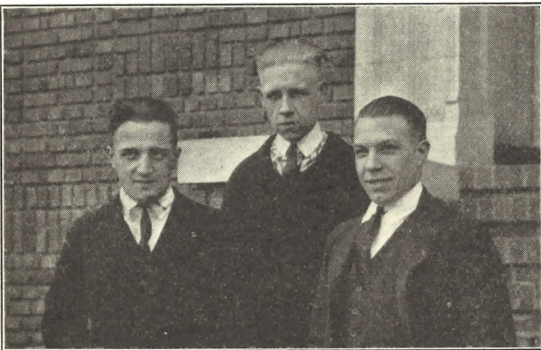
frames. Kansas City Radford had plenty of opportunity to demonstrate his plugging ability. He surely plugged the lights out at Rainier.

The total number of telephone calls originating in Rainier office that day was 36,199 as against a normal daily load of 12,500. Calls originating in all three of the new machine switching offices the first day after the cutover totaled 160,801, or an average of approximately thirteen calls per station.

Not until the third day succeeding the cut-over was the load restored to nearly normal, at which time the central office men began to get a normal nights sleep. Everyone worked hard to meet the extraordinary load placed upon the equipment. Unfortunately all day March 4th the weather conditions were such that most every subscriber remained at home, which accounts for one of the reasons for the abnormal use of telephones on that day.

#### ★ ★ MR. FULLERTON PLEASED

"A one hundred per cent cutover" remarked D. P. Fullerton when speaking of the big event. "The men who handled the cut before the cutover, not only in the central offices, but on all equipment and those who handled the central office work after the cutover did a bully good job."



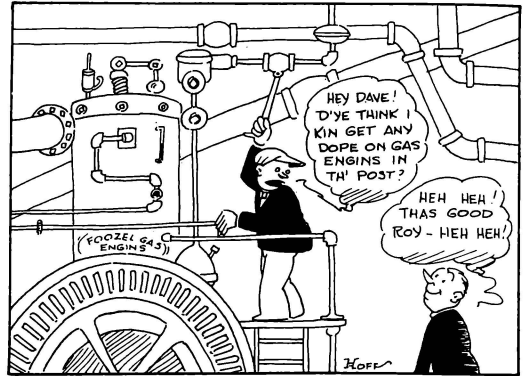
#### NIGHT SHIFT, RAINIER OFFICE

N. R. Forsythe, F. B. Weinand and H. E. Jordan.

Referring to the flood of calls handled by the offices he said, "The curiosity call the day following overburdened the equipment, but that was something which could not be controlled. Curiosity killed a cat, and so the telephone subscribers' curiosity killed telephone service the few days succeeding the cutover."

He expressed great appreciation of the splendid conduct of the telephone employees during the big overload, and concluded by saying that it was a one hundred per cent cutover.

#### WEST OFFICE



#### ROY D. SMITH AT THE THROTTLE

Dave O'Neil tells Roy Smith how to run gas engines during cut-over.



#### EVENING SHIFT, WEST OFFICE

Harry Just, H. C. Knapp, Roy Neighbor and R. K. Walker

#### ★ ★ A WORD FROM MR. MOORE

Seattle, March 26, 1923.

Editor Washington Translator.  
Seattle, Washington.

Please allow me space in your publication to express my appreciation of the very satisfactory manner in which the conversion of Melrose, West and Rainier offices from manual to machine switching operation was effected.

The preparation and execution of the plans and the subsequent handling of the many problems involved in an undertaking of this magnitude has met every expectation and is evidence that the job was well done by every person who was in any way connected with it.

It was only through the splendid individual and departmental co-operation and the painstaking efforts of every employee that these results were obtained.

It was a regular "man sized" job, but it is the sort of a job when delivered everybody is proud of.

Jno. J. Moore,  
Superintendent of Maintenance.





#### DAY SHIFT, WEST OFFICE

Top row—C. G. Guffey, Jack Widitz, Fred Whittlesey, J. F. Nicholson, Walter Bogart. Second row—Leo Schroeder, W. C. Wallsted, Harry Lord, J. R. Fitzsimmons, H. E. Edgar, W. C. Lewis, H. E. Gough, Wm. Stenhouse, S. S. Crowell. Third row—H. W. Pendergast, G. F. Moon, chief switchman; D. A. Bregg. Fourth row—Mrs. Concannon, Miss McAllister, E. C. Oliver, wire chief; Miss Granger. Bottom row—Arthur Wood, Edgar Howell and E. H. Frink.

#### THE CO-ORDINATION COMMITTEE

The Co-ordination Committee was organized February 28, 1921, for the purpose of conducting



E. C. Oliver and Geo. Dunnavan waiting for a blow out at West office.

the machine switching project in Seattle, consisting of the following representatives from the

Plant, Commercial, Traffic and Revenue Accounting departments:

J. J. Moore, Plant Chairman.

W. C. Pickford, Commercial.

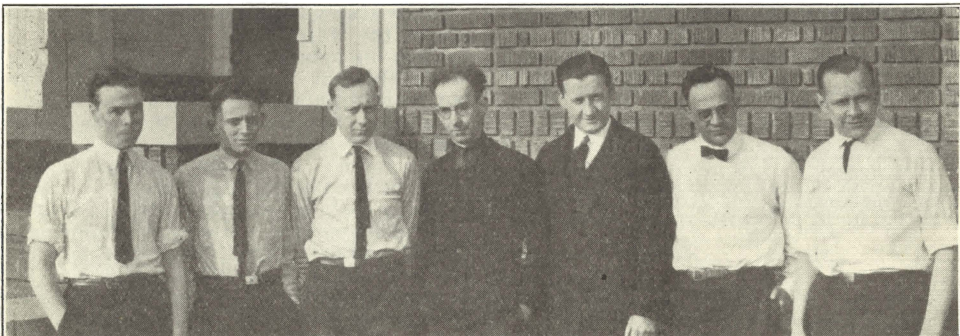
L. E. Winget, Traffic.

L. F. Gehres, Revenue Accounting.

D. R. Wiseman, advisory engineer, representing the chief engineer.

This committee prepared and maintained a complete working program and progress report of the project, assembled all necessary information, allocated all items of work to the proper departments, determined the departmental responsibilities and otherwise correlated the field work covered by the program.

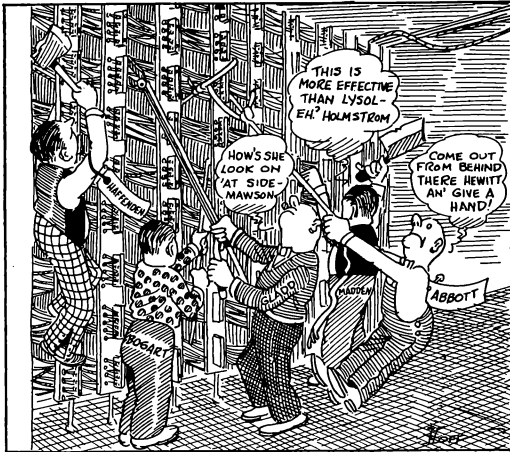
Each member was responsible to the commit-



#### NIGHT SHIFT, WEST OFFICE

C. W. Drake, H. C. Mealman, G. M. Dunnavan, R. D. Smith, D. H. O'Neil, W. C. Pearson, and Isaac Holmstrom.





### PUTTING OLD WEST OUT OF BUSINESS

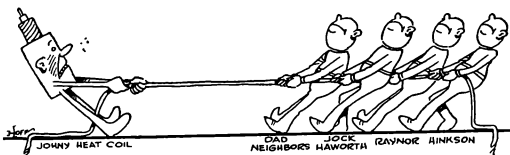
tee for the furnishing to the committee and to his department all information pertaining to the work of his department and also presented to the committee the field recommendations and reports covering the various items assigned. These recommendations were transmitted through the regular organization for approval and for the comment of other departments to the end that they had the benefit of all advice and the latest information available.

Every subject involved in the project was directed through the Co-ordination Committee so that each department became familiar with the problems and determined their share of the responsibilities.

Closely associated with this committee and rendering valuable assistance with every project were L. R. Mapes, engineer, representing the American Telephone and Telegraph Company of New York, and S. E. Rogers, resident engineer, representing the chief engineer's office of San Francisco.

### SEATTLE VISITORS DURING CUTOVER

J. C. Nowell, vice-president and general manager; C. W. Burkett, chief engineer, D. F. Fullerton, general superintendent of plant; Jno. H. Corcoran, general superintendent of traffic, San Francisco, Carl Whitmore, division superintendent of plant; C. E. Hickman, division commercial superintendent, Portland, Ore. N. R. Powley, division commercial superintendent, Los Angeles, Cal. D. E. Wiseman, equipment engineer; J. W. Powell, engineer, P. T. & T. Co.; R. E. Wolfe, traffic manager, P. T. & T. Co.; H. E. Van Etten, engineer, P. T. & T. Co.; J. H. Mitchell, engineer, machine switching problems; M. L. Stannard, supervisor of rates, San Francisco, Cal. C. W. Whiteside, W. E. Co. engineer; J. H. St. Clair, W. E. Co. engineer, Hawthorne, Ill. V. W. Russell, equipment engineer; G. L. Larson, superintendent of maintenance, Portland, Ore. L. R. Mapes, engineer, A. T. & T. Co., New York, N. Y. J. J. Foley, W. E. Co. C. J. Hurley, W. E. Co., San Francisco, Cal. A. E. Van Hagen, A. T. & T. Co., New York, N. Y. O. C. Hoff, division plant engineer, Portland, Ore. C. W. Twelves, P. S. Tel. Co.; W. N. Winter, P. S. Tel. Co., Everett, Wn. C. B. Allsopp, division superintendent of traffic, Portland, Ore. L. A. Dolan, A. T. & T. Co., New York. J. K. Maxwell, traffic department,



HOW IT WAS DONE AT RAINIER

P. T. & T. Co.; F. Prince, traffic department, P. T. & T. Co., San Francisco. W. D. Sargent, A. T. & T. Co., New York. M. R. Sullivan, traffic department, P. T. & T. Co., San Francisco. W. H. Matthies, W. E. Co.; R. H. Phlanz, W. E. Co.; R. W. Harper, W. E. Co., New York.

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### F. W. Cameron Transfers to Los Angeles

Fred W. Cameron resigned his position as supervising foreman of installation in Seattle and left for Los Angeles, Cal., where he expects to continue in the employ of our company.

Fred is going south in hope that it will benefit his wife's health. She has been ill for some time and his doctor's advised a change to a warmer climate.

His many friends in Seattle regret very much to lose him, and sincerely hope that the change will result in the expected restoration of his wife's health.

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### Special! Extra!

Earl A. Thompson will be married across the lake on April 15th. Everybody is invited. Your "presents" will be greatly appreciated.

★ ★

### Steamship Advertisement

Garfield Office, March 12, 1923.

Editor Translator:

Dear Sir: We wish to call your attention to an article in the March issue of the Translator concerning one passenger steamship owned and operated by Howard Whittlesey and George Pace Co., Inc.

For your information we wish to state that said boat is a "speed boat", not a steamship (the guy that sold it to us said so). Why, only last Sunday while we were touring on Lake Washington, we beat an Evinrude in a thrilling race of one mile. We won the race by one-half length (12 ft.). We wish to correct your statement as to our engine. It is not a Maxwell, it's a Metz.

(Signed) Capt. George L. Pace,

Ch. Eng. Howard H. Whittlesey.

Note: You made a mistake in the ownership. It is George, not Ray Pace. Also we wish to say that Archie Marston is the best mate on Lake Union.

★ ★

### West Office

Tarzan Pendergast, the boy orator of West office, challenges Senator Parmalee of Melrose office to a debate before the inmates of the Orphan's Home or Deaf and Dumb Society.

Hah Hoo Drake, big cheese of the Local Lion Tamers Club, is now making a membership drive.

Since Harry Mealman hasn't the time to operate on the trap drums he is looking for a means to curb his appetite.

We thought George Dunnavan had reformed, but he is slipping back to the need of a breakfast en route. George insists that his breakfast be delivered by a dumb waiter.

Ben Moon is contemplating installing a Pullman berth in his Pacific City Limited.

Harry Lord is operating a taxi service for love sick telephone men. His last customer was Harry Duvall of East office. Harry will be sicker when the taxi bill is presented.

Any one wishing to get in touch with R. D. Smith, the handsome apparatus expert of West office, will give the following call: One spit, one put, one back fire from our new gas engine will bring Mr. Smith to the engine room in nothing flat.

### H. F. Willey Breaks Leg

H. F. Willey, division methods accountant, fell and broke his leg at Second Avenue and Seneca Street, Thursday afternoon, March 8th. He was in the act of crossing the street and was about to step upon the curb when he slipped, causing him to fall with the above results. Both bones were broken just above the ankle and in addition the larger of the two bones in the lower leg was split for a distance of about 6 inches up the leg. He was given immediate hospital attention and is now at his home in the Westminster Apts., 903 9th Avenue, where he will be glad to have telephone employees visit him.

★ ★

R. N. Strand, F. J. Sheerin and G. A. Bauer, central office repairmen, who came here last December from San Francisco to help us over the rough spots prior to and during the big cutover, returned home March 10th, three very tired men. We worked them hard while they were with us, but didn't mean any harm by it. They did a mighty good job, and when they left the gang missed them. We hope that we may have them with us again some time.

★ ★

### LEARN ONE THING A MONTH

In the preceding lesson you were given some idea as to the nature of magnetism and a few of its characteristics.

We will take up this month some application of magnetism.

Probably at times you have wondered how the revolving of the armature in a dynamo produced an electric current.

There exists what is termed a "natural phenomena" which means a condition that cannot be definitely accounted for, that if a closed coil is revolved at right angles to lines of force which flow from the north to the south pole of a magnet that a current will be set up in the coil flowing first in one direction and then in a reversed direction. We call such a current an alternating current. This principle is shown in Figure No. 1.

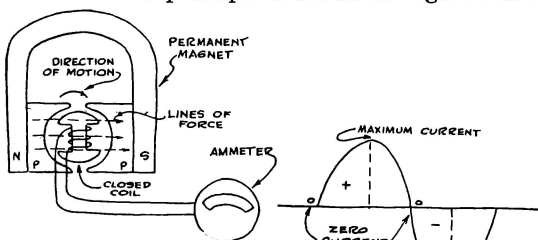


Fig. I.

Fig. II.

An alternating current is usually pictured as shown in Figure No. 2.

It does not matter whether the coil is rotated or if the magnetic field is rotated the result is the same as long as there is a cutting effect on the lines of force.

We have learned that every conductor carrying a current is surrounded by a magnetic field which we will call lines of force. Refer to Figure No. 1 in preceding lesson.

This fact can be demonstrated by a compass placed under the conductor as shown in Figure No. 3.

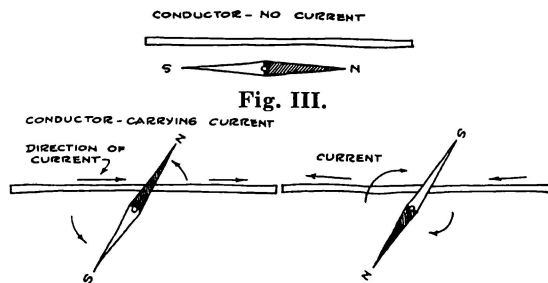


Fig. III.

From this experiment you will readily see that a compass can be used to ascertain the flow of current in any conductor.

It is suggested that you perform the following experiment:

Materials:

Soft iron rod or bolt, 6 inches long.

50 or 60 feet of No. 22 insulated wire.

First wind a layer of ten turns keeping the turns close together, make a loop and then wind an additional 20 turns as shown in Figure No. 4.

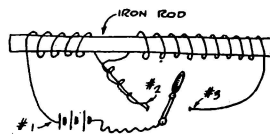


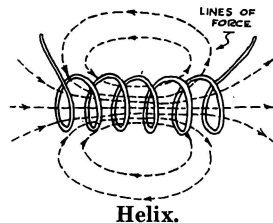
Fig. IV.

Second, connect wires 1 and 2 to the terminals of a dry cell and by means of a screw driver test the magnetism of the rod.

Now disconnect wire No. 2 and connect wire No. 3 and test the strength of the magnetism. You will notice that the greater number of turns produced a stronger magnetic effect.

The explanation of this is that the magnetic field surrounding each turn is added to the adjacent turn and so on and the presence of the soft iron core tends to concentrate these lines of force because it offers a path of lower resistance than if we used a coil of wire without an iron core.

A coil without an iron core is called a Helix. The difference in magnetic properties is shown in Figure No. 5.



Helix.

Fig. V.

Figure No. 1 indicates comparatively few lines of force as compared with the coil with an iron core. Therefore the greater the number of lines of force flowing from the north pole of an electro magnet to the south pole, the greater the attracting power.